



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,724	12/10/2004	Mario Andjelic	P16519US1	6053

27045 7590 08/21/2006

ERICSSON INC.
6300 LEGACY DRIVE
M/S EVR C11
PLANO, TX 75024

EXAMINER

SEYE, ABDOU K

ART UNIT PAPER NUMBER

2194

DATE MAILED: 08/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/517,724

Applicant(s)

ANDJELIC, MARIO

Examiner

Abdou Karim Seye

Art Unit

2194

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/10/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is the initial office action based on the application filed on June 19, 2002.

Claims 1-29 are currently pending and have been considered below.

Claim Rejections - 35 USC § 112

2. Claims 15 and 27 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a system and method of operating a system kernel space and user space access to a network interface controller, does not reasonably provide enablement for providing integrated kernel-space access and user-space access over the same NIC. The system and method in these claims consist of a single step: "using a single definition for providing integrated kernel-space access and user-space access over the Same NIC", and thus are interpreted as single means/single step claims under MPEP 2164.08(a).

A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). When claims depend on a recited property, a fact situation comparable to Hyatt is possible, where the claim covers every conceivable structure (means) for

Art Unit: 2194

achieving the stated property (result) while the specification discloses at most only those known to the inventor.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter that the applicant regards as his invention.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Appropriate clarification is required on the following claim:

Claim 20 recites the limitation "the transmit buffer". There is insufficient antecedent basis for the limitation in this claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2194

5. Claims 1-2, 7-8 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by **Shaw, Richard, L (WO 9939254)**.

Claim 1: Richard discloses a network device driver architecture comprising:

a. A kernel-space device driver adapted for enabling access between kernel space and user space via a kernel-space-user-space interface (fig. 2/28, col. 6, lines 3-7); and

b. User-space device driver functionality adapted for enabling direct access between user space and said NIC via a user-space-NIC interface, and said user-space device driver functionality adapted for interconnecting said kernel-space-user-space interface and said user-space-NIC interface to enable integrated kernel-space access and user-space access to said NIC (fig. 2/26 col. 6, lines 7-11).

Claim 2: Richard discloses a network device driver architecture as in claim 1 above and further discloses that the kernel-space device driver is adapted to said user-space device driver functionality (fig. 2/46,56,44, col. 9, lines 30-35).

Claim 7: Richard discloses a network device driver architecture as in claim 1 above and further discloses that the user-space device driver functionality is configured for execution in application context of a user application (fig. 2/42,46 col. 9, lines 9-35).

Claim 8: Richard discloses a network device driver architecture as in claim 7 above and further discloses that the user-space device driver functionality is implemented as user-space library functionality (fig. 2, col. 7, lines 23-26).

Claim 15: Richard discloses a system for enabling operating system kernel space access as well as user space access to a network interface controller (NIC), said system comprising:

a. Means for integrated kernel-space access and user-space access over the same NIC (fig. 2/26,28,58,50, col. 6 lines 1-35).

Claim 16: Richard discloses a system for enabling operating system kernel space access as well as user space access to a network interface controller (NIC) as in claim 15 above and further discloses that the same NIC comprises:

a. Means for direct access between user space and NIC (fig. 2/58 col. 5, lines 30-35); and

b. Means for user-space tunneled access between kernel-space and said NIC (fig. 2/30, 34, 54, 56, 58,50, col. 7, lines 3-20).

Claim 17: Richard discloses a method for enabling access between operating system kernel space and a network interface controller (NIC) as well as between user space and said NIC, said method comprising the steps of:

a. Enabling access between kernel space and user space via a kernel-space-user-space interface (fig. 2/28,26, col. 6, lines 3-11);

b. Enabling direct access between user space and said NIC via a user-space-NIC interface (fig. 2/ 58, col. 6, lines 3-11); and

c. Interconnecting said kernel-space-user-space interface and said user-space NIC interface to enable user-space tunneled access between kernel-space and said NIC (fig. 2/54,56,58, col. 7, lines 3-20).

Claim 22: Richard discloses a method for enabling access between operating system kernel space and a network interface controller (NIC) as well as between user space and said NIC as in claim 17 above and further discloses the step of enabling direct access between user space and said NIC and said interconnecting step are executed in application context of a user application (fig. 2/26, col. 7, lines 23-30).

Claim 23: Richard discloses a method for enabling access between operating system kernel space and a network interface controller (NIC) as well as between user space and said NIC as in claim 22 above and further discloses the step of enabling direct access between user space and said NIC and said interconnecting step are performed by user-space device driver functionality implemented as user-space library functionality (fig. 2/46,48,72,76, col. 7, lines 23-30).

Claim 27: Richard discloses a method for enabling operating system kernel space access as well as user space access to a network interface controller (NIC), said method comprising the step of providing integrated kernel-space access and user-space access over the same NIC (fig. 2/26,28,50, col. 6, lines 30-35).

Claim 28: Richard discloses a method for enabling operating system kernel space access as well as user space access to a network interface controller (NIC) as in claim 27 above and further discloses that the said step of providing integrated kernel-space access and user-space access over the same NIC comprises the steps of:

- a. Enabling direct access between user space and NIC (fig. 2/58, col. 6, lines 3-11); and

b. Enabling user-space tunneled access between kernel-space and said NIC
(fig. 2/30,34,54,56,58, col. 7, lines 3-20).

Claim 29: Richard discloses a method for enabling operating system kernel space access as well as user space access to a network interface controller (NIC) as in claim 27 above and further discloses that the integrated kernel-space access and user-space access is provided over the same NIC port (fig. 6, col. 15, lines 1-6).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103 (a) which forms the basis for all obvious rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3-6, 18-21 and 24-26 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Richard. (**WO 9939254**) in view of Cezary Dubnicki et al:
(“Software support for virtual memory-mapped communication”)

Claims 3-6: Richard discloses a network device driver architecture as in claim 1 above comprising a user-space device driver and a kernel-space device driver, but does not explicitly disclose a network architecture comprising of a memory buffer with

Art Unit: 2194

memory addresses and pointers for fetching pointer information, inserting it into other memory buffer interface; a transmit and receive buffer. However, in the same field of endeavor Dubnicki discloses a system architecture that allows a user application to transmit and receive data in memory buffer within two different interfaces sharing common memory; transmit and receive buffer (fig. 1 section, 3, page 373). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include a transmit and a receive buffer feature into Richard's invention to make the same invention, because it would have been faster to fetch pointer information from one memory buffer into another memory buffer interface such as a receive buffer associated with a network space of a network interface card (NIC) or a hardware. One would have been motivated to add a transmit and receive buffer into Richard's invention in order to have a very little processor involvement in data fetched from the transmit buffer and inserted to receive buffer. Therefore, the elimination of operating system involvement for improving communication performance among users within system architecture.

Claims 18-21: Richard discloses a method for enabling access between an operating system kernel space and a network interface controller (NIC), between an user space and a said NIC as in claim 17 above comprising a user-space device driver and a kernel-space device driver, but does not explicitly disclose a network architecture comprising of a memory buffer with memory addresses and pointers for fetching pointer information, inserting it into other memory buffer interface; a transmit and receive buffer.

However, in the same field of endeavor Dubnicki discloses a system architecture that allows a user application to transmit and receive data in memory buffer within two different interfaces sharing common memory; transmit and receive buffer (fig. 1 section, 3, page 373). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include a transmit and a receive buffer feature into Richard's invention to make the same invention, because it would have been faster to fetch pointer information from one memory buffer into another memory buffer interface such as a receive buffer associated with a network space of a network interface card (NIC) or a hardware. One would have been motivated to add a transmit and receive buffer into Richard's invention in order to have a very little processor involvement in data fetched from the transmit buffer and inserted to receive buffer. Therefore, the elimination of operating system involvement for improving communication performance among users within system architecture.

8. Claims 9-11, 12-14 and 24-26 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Richard. (**WO 9939254**) in view of Massa et al: (**US6658469**).

Claims 9-11: Richard discloses a network device driver architecture as in claim 1 above comprising a user-space device driver and a kernel-space device driver, but does not disclose a first operational mode and a second operational mode for accessing user-kernel-NIC space and switching from first operation mode to second operation mode in response to a user application failure and to no user application call. However

Art Unit: 2194

in the same field of endeavor Massa discloses a system and method for directing data transfer between applications and devices using a transport provider switch to determine whether to use a primary transport provider or a secondary transport provider if a provider fails to process the application connect request (fig. 3. col. 8 line 47-67). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to add this feature into Richard's system to make the same invention, because it would have improved the data transfer performance and reduce the delay in case of failure. One would have been motivated to use alternative transport provider; the network transport switch in order to improve data transfer performance by applying an adaptive flow control protocol that adjusts its data transfer strategy based on the behavior of the communication applications.

Claims 24-26: Richard discloses a method for enabling access between an operating system kernel space and a network interface controller (NIC), between an user space and a said NIC as in claim 17 above comprising a user-space device driver and a kernel-space device driver, but does not disclose a first operational mode and a second operational mode for accessing user-kernel-NIC space and switching from first operation mode to second operation mode in response to a user application failure and to no user application call. However in the same field of endeavor Massa discloses a system and method for directing data transfer between applications and devices using a transport provider switch to determine whether to use a primary transport provider or a secondary transport provider if a provider fails to process the application connect

Art Unit: 2194

request (fig. 3. col. 8 line 47-67). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to add this feature into Richard's system to make the same invention, because it would have improved the data transfer performance and reduce the delay in case of failure. One would have been motivated to use alternative transport provider; the network transport switch in order to improve data transfer performance by applying an adaptive flow control protocol that adjusts its data transfer strategy based on the behavior of the communication applications.

Claims 12-14: Richard discloses a network device driver architecture as in claim 1 above comprising a user-space device driver and a kernel-space device driver and further discloses a network device driver operable for directly accessing a NIC (fig.2/46,58,50), but does not explicitly disclose a kernel-space agent for managing said kernel-space-user-space interface. However, in the same field of endeavor Massa discloses a system and method for directing data transfer between applications and devices using a transport provider switch to determine whether to use a primary transport provider or a secondary transport provider if the first provider fails to process the application connect request as in claims 9-11 above and he further discloses that the device switch manages applications direct access to a "SAN NCI " interface through a "SAN TDI" provider (fig. 4 col. 9, lines 34-67; fig. 5). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to add

this feature into Richard's invention to make the same invention, because the above switch device could have been used as a kernel-space agent for preventing unauthorized users to access the network. One would have been motivated to include a watchdog function within the switch device in order to manage a user application failure and to allow the switch to change operational mode to gain performance.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pratt, I et al: "Arsenic: a user-accessible gigabit Ethernet interface"
(IEEE, Vol. 1, 2001)

Dunning, D. et al: " The virtual Interface architecture" (IEEE, volume:
18 Issue: 2, Mars/April 1998).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Exr. Abdou Seye whose telephone number is (571) 270-1062. The examiner can normally be reached Monday through Friday from 7:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James W. Myhre whose telephone number is (571) 272-6722. The fax phone number for Formal or Official faxes to Technology Center 3600 is (571) 273-8300. Draft or Informal faxes, which will not be

Art Unit: 2194

entered in the application, may be submitted directly to the examiner at (571) 273-6722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Receptionist whose telephone number is (571) 272-3600.

AKS
August 10, 2006
Examiner



James W. Myhre
Supervisory Patent Examiner